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02/02/2005 10:44 AM

To Christopher Lichens/R9/USEPA/US@EPA
cc
bcc
Subject comments

Chris,

attached are the revised comments.



Tom CDM Phase 1a Report Jan 2005 - review comments_020205.doc



CDM Phase 1a Report Jan 2005 - review comments_020205.pdf

MEMORANDUM

CH2MHILL

Review Comments on Revised Report Addendum for Additional Data Collection in the Phase 1A Area, Omega Chemical Superfund Site, Whittier, California.

TO: Christopher Lichens/USEPA Region IX

FROM: Tom Perina/CH2M HILL, Riverside
Kerang Sun/CH2M HILL, Santa Ana

DATE: February 2, 2005

As you requested, CH2M HILL reviewed the document prepared by Camp Dresser & McKee, Inc. (CDM), dated January 11, 2005, titled *Revised Report Addendum for Additional Data Collection in the Phase 1A Area, Omega Chemical Superfund Site, Whittier, California*. The reviewed document is a revision of CDM's report dated June 27, 2003, and titled *Report Addendum for Additional Data Collection in the Phase 1A Area, Omega Chemical Superfund Site, Whittier, California*. CDM prepared the subject document on behalf of the Omega Chemical Site PRP Organized Group (OPOG).

Consistent with the oversight role of the U.S. Environmental Protection Agency (EPA), this technical memorandum presents recommendations that CH2M HILL believes will streamline and improve the project. The goal of this review is to confirm that the approach to the investigation is appropriate and consistent with the goals at this site and is consistent with typical industry practices.

This review lists comments sequentially as noted in the document. Editing-level issues are not addressed in this review.

General Comments:

1. The Statement of Work (SOW) accompanying the Consent Decree (CD) No. 00-12471 specifies (under Task 1 A.4) that OPOG will "Assess vertical and horizontal extent of groundwater contamination and aquifer hydraulics in the Phase 1a Area to the extent necessary to select, design and implement a remedy." Describe the distribution of contamination in groundwater within the Phase 1A Area, and identify the source zone(s) and transport pathways. Use contour maps, cross-sections, and diagrams, as appropriate, to show the extent of contamination both laterally and vertically. Utilize all site data (including soil investigation results) to infer the extent of groundwater contamination. The report should address the following questions: 1) Is groundwater contaminated beneath the entire Phase 1a Area, beneath a portion of it, or does the contamination extend beyond the Phase 1a Area boundaries as shown in Figure 1-3? 2) Is groundwater contamination in the Phase 1a Area limited to the shallow zone? (see the next comment) 3) Does all the shallow contaminated groundwater flow via the sand channel at OW8?

Also: Sec. 4.1. and 4.2. Include a conclusive statement whether the investigation provided sufficient data for the design of a remedial system as required in the CD, i.e., whether the objectives of the investigation have been met.

2. The groundwater flow direction in the deeper zone penetrated by wells OW8B and OW4B has not been determined. Given the difference in water levels in shallow and deep wells at the site, the groundwater flow direction in the deeper zone may differ from the flow direction in the water table aquifer. Analytical results for groundwater samples from well OW8B may not be representative of the contaminant distribution in the deeper zone if this well is not located directly downgradient from the source zone. EPA will install an additional well screened within the same unit to estimate the groundwater flow direction in the deeper zone from water levels measured in wells OW8B, OW4B, and the new well. Should the groundwater flow direction in the deep zone be different from the flow direction in the shallow zone, EPA will install an additional deep well downgradient of the former Omega property (or source zone). Should contamination be found in the deeper aquifer zone, OPOG's Engineering Evaluation/Corrective Action (EE/CA) will be required to address the deep zone.

Well OW1B seems to be screened above this deeper aquifer zone because of the following: The sandy unit found at the screen depth of wells OW4B and OW8B was not encountered within the depth interval of the screen of OW1B. The head drop (or apparent gradient) between OW8B and OW4B (from 11.88 feet to 111.12 feet over a distance of about 700 feet) is approximately 0.0011 (feet/feet, i.e. [-]) and between OW1B and OW8B (from 122.18 feet to 111.88 feet over a distance of about 220 feet) approximately 0.047 [-], based on August 2004 data. The head drop between OW1B and OW8B is greater than the gradient in the shallow zone of 0.01 [-] indicating that the head measured in OW1B is likely not representative of the deeper zone. OW1B is likely screened in a depth interval between the shallow and deeper aquifers.

Also: Page 4-1, 3rd paragraph. Clarify that the horizontal flow gradient was estimated for the shallow aquifer zone only. Discuss the change (or the lack of) in the horizontal flow gradient in the shallow zone over time.

3. Well OW4A is located south of the interpreted main contaminant transport pathway in the water table aquifer (inferred from groundwater monitoring results and historical hydropunch data). Consequently, this location is not appropriate for assessing attenuation of contaminants along the flowpath from the former Omega property. The transport pathway in the shallow aquifer can be quite narrow as evidenced in the proximity of OW8. EPA will install new wells to further assess the attenuation of contaminants downgradient of the former Omega property. Also: Page 4-1, 4th paragraph; page 4-3, 3rd paragraph; page 4-2, last paragraph; page 3-7, OW4 and OW4b.
4. A cross section along OW1 and OW8 is needed to illustrate the lateral extent of the interpreted sandy channel. CDM prepared a preliminary cross-section in 2004; the relevant part of this cross-section should be revised as necessary and included in this document. Assess whether the extent of the sand channel has been sufficiently characterized. Assess its likely relation to regional hydrostratigraphic units. This channel seems to be controlling contaminant transport in the shallow aquifer near the site. Knowing its extent will be needed for the design of a pump-and-treat system.

Also: Page 3-1, Section 3.1, page 4-1, last paragraph. Discuss in more detail the narrow contaminant transport pathway that seems to cross Puttnam Street near OW8. The differences in VOC concentrations measured in groundwater samples from OW8 as compared to the VOC concentrations measured in samples from OW2 and OW3 indicate the zone of high VOC concentrations is very narrow. This may be the result of lithologic control of contaminant migration or an indication that the main source area for groundwater contamination is laterally limited and directly up-gradient of OW8.

Page 3-6, 6th paragraph. Discuss also TCE concentrations measured in groundwater samples from OW2 and OW3.

5. Parts of the document are missing or incomplete, including Figures 1-1 and 1-2; Tables 3-5, 3-6, 3-8, and 3-9; and Appendices A, B, C, and D. The review suggests combining the content of each appendix into a single electronic file.

Specific comments:

1. Page 1-3, 2nd paragraph. The text states that a memorandum describing the proposed scope of work for additional data collection activities in Phase 1a area was submitted to USEPA on November 11, 2003, EPA's comments were received in December, and the proposed work was implemented during October and November 2003. Please provide the rationale for performing this work prior to the submission of the proposal.
2. Page 1-3, 3rd paragraph. State the objective for the installation of well OW8b; i.e., to evaluate potential impacts to the deeper zone.
3. Page 1-4, 1st paragraph. Include the objectives by reference to the CD.
4. Page 2-2, 1st paragraph. Provide information on the water level variation (i.e., trend, fluctuation, etc.) prior to the tests.
5. Page 2-2, 2nd paragraph. The text states that manual and transducer water levels showed good agreement. Include the manual readings on the plots of transducer data.
6. Page 2-6, Section 2.3. Refer to a map for soil boring/well locations when the locations are first discussed.
7. Page 2-7, 3rd paragraph. Provide the total depth of OW8b.
8. Page 3-2, 2nd paragraph. Provide an estimate of the thickness of the clay layer and assess its relation to regional hydrostratigraphic units.
9. Page 3-4, 2nd paragraph. The review recommends presenting composite hydrographs for each shallow-deep well pairs (OW4/OW4b, OW8/OW8b, and OW1/OW1B) to facilitate the discussion.
10. Page 3-5, 4th paragraph. Include TCE in the discussion of groundwater samples from OW1A.
11. Page 3-7, 2nd paragraph. The concentrations of 1,4-Dioxane are not "discussed above" but in Section 3.3.4.

Page 3-9, last paragraph. The text indicates that 1,4-Dioxane concentration in OW8A peaked at 5,300 µg/L during August 2004 sampling, and speculates that installation of OW8B (in August 2004) may have contributed to the increased concentration. CH2M HILL sampled the well in June 2004 with a similar result of 5,000 µg/L for 1,4-Dioxane. The suspected effect of OW8B installation on 1,4-Dioxane concentrations in OW8A can be ruled out.

12. Page 3-11, 1st paragraph. Only PCE and 1,4-Dioxane in the soils are discussed. Include TCE and other major contaminants in the discussion. Page 4-2, 2nd paragraph. The main contaminants in the source area should also include 1,4-Dioxane.
13. Page 3-11, 1st paragraph. The text states that high PCE concentrations in soil likely resulted from contaminants migrating to the capillary fringe during times of rising water levels. This seems to contradict earlier statements regarding generally declining water levels in the area. Does the text refer to historical high water table conditions?
14. Page 3-12, 3rd paragraph. Discuss the increase in 1,4-Dioxane concentrations following pumping from OW8 and the lack of similar increase in concentrations of other compounds such as PCE and TCE. This increase suggests a possible difference between their transport and release mechanisms.
15. Page 3-13, last paragraph. The text mentions that OW1B showed a similar trend to OW8 during the pumping but concludes it was coincidental; the review recommends monitoring of OW1 (A and B) response during future pumping at the site.
16. Page 4-2, 3rd paragraph. Assess/discuss the potential mobility of the suspected DNAPL.
17. Page 4-4. Discuss the extent of 1,4-Dioxane. Because 1,4-Dioxane does not adsorb significantly to soil particles and does not readily degrade, it is expected to migrate in groundwater ahead of chlorinated VOCs.
18. Page 4-5, Aquifer Characteristics. Discuss the potential existence of preferential pathways.
19. Sec. 3.5.2, Table 3-10, Appendix E. Beta (shown in E-5 and E-6, not legible on E-6) is an intermediate result; the document (e.g., Table 3-10) should show the horizontal and vertical hydraulic conductivity, specific storage, and specific yield estimated through the analysis using the Neuman method. A composite plot should be shown for PZ1 and PZ2 and the difference in the drawdown recorded at the similar distances and its implications for the analysis results should be discussed (i.e., the failure of composite analysis of PZ1 and PZ2 data, different estimates of specific yield, etc.). State what value of saturated thickness was used in the analysis. State why a method for fully penetrating wells (Neuman, 1972) instead of one for partially penetrating wells (Neuman, 1974; Moench, 1997) was used (e.g., because of uncertainty regarding the aquifer geometry?). The review notes that the aquifer response indicated heterogeneity on the scale of the well spacing precluding a more detailed analysis of the test data using a uniform-aquifer model; a (brief) discussion of these effects is warranted because the drawdown response provides additional information on the aquifer near OW8.
20. Fig. E1 to E4. The units for t/t' are not minutes; this quantity is dimensionless.

Appendix E. The analysis of recovery data from OW3 can constrain the value of T ; note that the straight-line fit to the data should pass through $t/t' = 1.0$. Could the pump valve leak during the recovery of OW4A (resulting in the fast recovery)? The results for OW4A and OW8A are suspect; the review suggests not using them as representative of the aquifer unless they are independently supported.

21. Page 4-1, Sec. 4.1.2. All chemicals detected in groundwater samples from the Phase 1a Area wells need to be considered compounds of interest if extracted groundwater must be treated for these compounds prior to discharge.
22. Page 4-5, Sec. 4.1.5. Delete "Reliable" in the second sentence. Because of the heterogeneity of the tested aquifer, the review considers the OW8 multi-well pumping test results as being the upper and lower estimates of the aquifer transmissivity at best.